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EXAMINER	
DASTOURI, MEHRDAD	
ART UNIT	**PAPER NUMBER**
2623	15

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/400,755	HARRINGTON, STEVEN J.	
	Examiner	Art Unit	
	Mehrdad Dastouri	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 February 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6, 8-10 and 12-17* is/are rejected.

7)☒ Claim(s) *7 and 11* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's amendment filed July 11,2003, has been entered and made of record.

2. Applicant's arguments have been fully considered but they are not persuasive. Regarding Claim 1, Applicant argues in essence that prior art of record (Kuzunuki et al) fails to disclose the projection of a movable real object in three-dimensional free space. Applicant further argues that Kuzunuki et al utilize identifier and location of the actual object is not a representative characteristic.

The Examiner disagrees and indicates that Claim 1 recites in the preamble "a preselected movable real object disposed in three-dimensional free space". A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Furthermore, it is respectfully submitted that the items depicted in Figure 3B including the desktop surface, hands, Items (a) to (i) are also movable real objects disposed in three dimensional free space (i.e., these items can be moved in three-dimensional free space).

It is further submitted that the representative characteristics of the movable objects are characteristic point coordinates of actual objects (Column 2, Lines 41-56)

and identifiers such as their center, corner and end points as explained in Column 8, Lines 15-67, Column 9, Lines 1-25. which are not preselected marked standard and printed identifiers (e.g., fiducial marks). Kuzunuki et al teachings meet the claimed invention recited in Claim 1.

Regarding Applicant arguments concerning Claims 2, 4, it is respectfully submitted that all items depicted in Figure 3B including the desktop surface, hands, Items (a) to (i) are disposed in three dimensional free space. Desktop surface reads the claimed limitation of "reference panel".

Regarding Applicant arguments concerning Claims 3, 5 and 6, with consideration of the above mentioned response for Claim 1 arguments, the cited parts of the prior art of record referred to in detail rejection of these claims clearly meet claimed invention recited in Claims 3, 5 and 6.

Regarding Claim 8, it is respectfully submitted that Wilson et al teachings are merely cited for disclosing unprojecting the dimensional representation of the object in the viewing plane which is an standard conventional methodology. The teachings of Kuzunuki et al and Wilson et al are in the same field of endeavor of verifying movable real objects in an augmented-reality display system, and are therefore combinable.

3. Applicant's arguments regarding amended Claims 7 and 11 (Page 12, Lines 18-21, Page 13, Lines 17-18) are persuasive and the rejection of Claims 7 and 11 are withdrawn.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-6, 13, 14 and 16 are under 35 U.S.C. 102(e) as being anticipated by Kuzunuki et al (U.S. 6,266,057).

Regarding Claim 1, Kuzunuki et al disclose a method of verifying a projected image within a three-dimensional view plane of an augmented-reality display system as a preselected movable real object disposed in three-dimensional free space (Column 2, Lines 31-40), whereby the object may be employed as an interface tool for the system, comprising steps of:

identifying a representative characteristics of the movable real object within the three-dimensional view plane wherein the representative characteristics comprises shape and location of the object and is exclusive of preselected marked standards and printed identifiers (Figures 3-14; Column 7, Line 46 through Column 10, Line 26, in particular, Column 8, Lines 15-31. The actual movable objects illustrated in Figure 3A will be identified by their center, corner and end points as explained in Column 8, Lines 15-67, Column 9, Lines 1-25. The real (actual) objects do not contain registration marks and printed identifiers for identification purpose.);

determining dimensional aspects of the movable object from the projected image (Figures 7B and 8B; Column 9, Lines 9-25);

computing a corresponding dimensional identity and location of the movable real object at an object point relative to the view plane (Figure 3A; Column 6, Lines 23-32; Column 6, Lines 44-67; Column 8, Lines 1-31); and

verifying whether the dimensional identity and location are reasonably consistent with predetermined standards for the object (Figure 3A; Column 6, Lines 23-32; Column 6, Lines 44-67; Column 8, Lines 1-31; Column 9, Lines 25).

Regarding Claim 2, Kuzunuki et al disclose the method as claimed in Claim 1 wherein the preselected object comprises a reference panel as a screen, tablet or piece of paper (Figure 3A, File abc, Memo (g)), and identifying includes recognizing a corner of the panel (Figures 1, 3A and 3B; Column 7, Lines 58-67, Column 8, Lines 1-31; Column 9, Lines 9-25).

Regarding Claim 3, Kuzunuki et al further disclose the method as claimed in Claim 2 wherein the dimensional aspects of the object is determined by calculating distances between corners and a center point of the reference panel (Figures 9-14 and 19; Column 6, Lines 23-32; Column 6, Lines 50-67; Column 9, Lines 20-25; Column 11, Lines 23-35; Column 15, Lines 30-67, Column 20, Lines 1-20. Dimensional aspects (actual objects attributes) are calculated based on the coordinate system in coordinate input unit TB. The origin of the coordinate system can be any arbitrary point including the center of the reference panel 101.).

Regarding Claim 4, Kuzunuki et al further disclose the method as claimed in Claim 3 wherein the computing comprises converting the calculated distances to the dimensional identity and location based on an assumption that the reference panel is structurally flat (Figures 9-19; Column 6, Lines 23-32; Column 6, Lines 50-67; Column 9, Lines 20-25; Column 11, Lines 23-35; Column 15, Lines 30-67, Column 20, Lines 1-20. Computing is based assuming the reference panel as structurally flat pages of a book.).

Regarding Claim 5, Kuzunuki et al further disclose the method as claimed in Claim 1 wherein the verifying includes testing from at least one of the tests of (a) whether the movable real object has expected dimensions or proportions, (b) whether the corners are right angles, (c) whether a center point matches when calculated from distinct sets of the corners, (d) whether corners are generally in a common plane, and (e) whether the object lies within an expected viewing range (Figures 9-19; Column 6, Lines 23-32; Column 6, Lines 50-67; Column 9, Lines 20-25; Column 11, Lines 23-35; Column 15, Lines 30-67, Column 20, Lines 1-20).

Regarding Claim 6, Kuzunuki et al further disclose the method as claimed in Claim 1 wherein the preselected object comprised of three equidistant line points and determining the projected dimensions of the three equidistant line points (Figures 9A-9D and 19; Column 9, Lines 20-25; Column 11, Lines 23-35; Column 15, Lines 30-67, Column 20, Lines 1-20).

With regards to Claim 13, arguments analogous to those presented for Claim 1 are applicable to Claim 13. A piece of paper has been utilized as the real item as depicted in Figure 3A.

With regards to Claim 14, arguments analogous to those presented for Claim 2 are applicable to Claim 14.

Regarding Claim 16, arguments analogous to those presented for Claim 5 are applicable to Claim 16.

6. Claims 8-10, 12, 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuzunuki et al (U.S. 6,266,057) in view of Wilson et al (U.S. 6,278,479).

Regarding Claim 8, arguments analogous to those presented for Claim 1 are applicable to Claim 8.

Kuzunuki et al do not explicitly disclose unprojecting the dimensional representation to calculate a plurality of object coordinates representative of a size of the object and a distance of the object from the viewing plane.

Wilson et al disclose a dual reality system comprising calculating a plurality of object coordinates representative of a size of the object and a distance of the object from the viewing plane by unprojecting the dimensional representation of the object in the viewing plane (Figures 3-15; Column 7, Lines 45-67, Column 8, Lines 1-43).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Kuzunuki et al invention according to the teachings of Wilson et al to calculate a plurality of object coordinates representative of a size of the

object and a distance of the object from the viewing plane by unprojecting the dimensional representation of the object in the viewing plane because it will provide enhanced visualization of an augmented reality system comprising of a computer generated image superimposed with a real image.

Regarding Claims 9 and 10, arguments analogous to those presented for Claim 6 are applicable to Claims 9 and 10.

Regarding Claim 12, arguments analogous to those presented for Claim 5 are applicable to Claim 12.

Regarding Claim 15, Kuzunuki et al do not explicitly disclose the system as defined in Claim 14, wherein the controller includes means for computing three dimensional object coordinates of the piece of paper relative to the view plane.

Wilson et al further disclose a dual-reality system comprising means for computing three dimensional object coordinates relative to the view plane (Figures 3 and 10-15; Column 7, Lines 45-67, Column 8, Lines 1-43).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Kuzunuki et al invention according to the teachings of Wilson et al to compute three dimensional object coordinates relative to the view plane because it is the most fundamental and straight forward method for determining three dimensional coordinates of a two-dimensional geometric shapes such as sheet of papers relative to a viewing point outside the object plane.

Regarding Claim 17, Wilson et al further disclose the method defined in Claim 8 wherein the unprojecting comprises unprojecting a plurality of dimensional

representation of the object attribute to movement of the object in the variable viewing area (Figures 3 and 10-15; Column 7, Lines 45-67, Column 8, Lines 1-43).

Allowable Subject Matter

7. Claims 7 and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 7 and 11 of the instant invention recites the method as defined in Claims 6 and 8, respectively, wherein the computing comprises calculating X, Y and Z coordinates in real space of the movable real object point based on the projected dimensions of the three equidistant line points in the view plane and known augmented-reality display system geometric dimensions.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mehrdad Dastouri whose telephone number is (703) 305-2438. The examiner can normally be reached on Monday to Friday from 8:00 a.m. to 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (703) 308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MEHRDAD DASTOURI
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May 12, 2004